VIRTUAL LAB – STOICHIOMETRY AND LIMITING REAGENTS

Objective: Calculate the needed quantities of reactants and products in a chemical reaction and identify limiting reagents.

Magnesium reacts with hydrochloric acid in a single replacement reaction.
Write and balance the equation below:

Materials you are using:
3 250-ml Erlenmeyer flasks
3 balloons
Magnesium ribbon
Hydrochloric acid (1.0M)

Procedure:

1. You've added 100 ml of hydrochloric acid to each flask.

2. You've weighted out 0.6g, 1.2g, and 2.4g of magnesium ribbon, and placed each piece into a balloon.

3. You've stretched the balloon over the mouth of the flask, and allowed the magnesium to drop into the flask to react with the hydrochloric acid.
   Flask 1 = 0.6 g, Flask 2 = 1.2 g; Flask 3 = 2.4 g

Analysis:

1. Using stoich calculations, compute the volumes of hydrogen gas (in moles) that would be produced in each balloon based on the amount of magnesium used..

2. Now, based on your answers above, calculate the amount of HCl needed for each balloon.

2. The 100ml of 0.1M HCl is equal to 0.1 moles of HCl per flask. Which flask had the exact amount of HCl needed?

3. Which flask had too much HCl (too little magnesium)?

4. Which flask had too little HCl?

5. A limiting reagent is a reactant that there is not enough of. What are the limiting reactant for each flask?/